

SEQUENCE LISTING

(1) GENERAL INFORMATION:

- (i) APPLICANT: Chang, Lung-Ji
- (ii) TITLE OF INVENTION: Combination Immunogene Therapy
- (iii) NUMBER OF SEQUENCES: 25
- (iv) CORRESPONDENCE ADDRESS:
 - (A) ADDRESSEE: Medlen & Carroll, LLP
 - (B) STREET: 220 Montgomery Street, Suite 2200
 - (C) CITY: San Francisco
 - (D) STATE: California
 - (E) COUNTRY: United States of America
 - (F) ZIP: 94104
- (v) COMPUTER READABLE FORM:
 - (A) MEDIUM TYPE: Floppy disk
 - (B) COMPUTER: IBM PC compatible
 - (C) OPERATING SYSTEM: PC-DOS/MS-DOS
 - (D) SOFTWARE: PatentIn Release #1.0, Version #1.30
- (vi) CURRENT APPLICATION DATA:
 - (A) APPLICATION NUMBER: US
 - (B) FILING DATE:
 - (C) CLASSIFICATION:
- (viii) ATTORNEY/AGENT INFORMATION:
 - (A) NAME: Ingolia, Diane E.
 - (B) REGISTRATION NUMBER: 40,027
 - (C) REFERENCE/DOCKET NUMBER: CHANG-02687
- (ix) TELECOMMUNICATION INFORMATION:
 - (A) TELEPHONE: (415) 705-8410
 - (B) TELEFAX: (415) 397-8338

(2) INFORMATION FOR SEQ ID NO:1:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 6145 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: DNA (genomic)
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

GAATTCATAC CAGATCACCG AAAACTGTCC TCCAAATGTG TCCCCCTCAC ACTCCCAAAT	60
TCGCGGGCTT CTGCCTCTTA GACCACTCTA CCCTATTCCC CACACTCACC GGAGCCAAAAG	120
CCGCGGCCCT TCCGTTTCTT TGCTTTTGAA AGACCCACC CGTAGGTGGC AAGCTAGCTT	180
AAGTAACGCC ACTTTGCAAG GCATGGAAAA ATACATAACT GAGAATAGAA AAGTTCAGAT	240
CAAGGTCAGG AACAAAGAAA CAGCTGAATA CCAAACAGGA TATCTGTGGT AAGCGGTTCC	300

TGCCCCGGCT	CAGGGCCAAG	AACAGATGAG	ACAGCTGAGT	GATGGGCCAA	ACAGGATATC	360
TGTGGTAAGC	AGTTCCTGCC	CCGGCTCGGG	GCCAAGAACA	GATGGTCCCC	AGATGCGGTC	420
CAGCCCTCAG	CAGTTTCTAG	TGAATCATCA	GATGTTTCCA	GGGTGCCCCA	AGGACCTGAA	480
AATGACCCTG	TACCTTATTT	GAACATAACCA	ATCAGTTTCG	TTCTCGCTTC	TGTTTCGCGCG	540
CTTCCGCTCT	CCGAGCTCAA	TAAAAGAGCC	CACAACCCCT	CACTCGGCGC	GCCAGTCTTC	600
CGATAGACTG	CGTCGCCCCG	GTACCCGTAT	TCCCAATAAA	GCCTCTTGCT	GTTTGCATCC	660
GAATCGTGGT	CTCGCTGTTC	CTTGGGAGGG	TCTCCTCTGA	GTGATTGACT	ACCCACGACG	720
GGGGTCTTTC	ATTTGGGGGC	TCGTCCGGGA	TTTGGAGACC	CCTGCCCAGG	GACCACCGAC	780
CCACCACCGG	GAGGTAAGCT	GGCCAGCAAC	TTATCTGTGT	CTGTCCGATT	GTCTAGTGTC	840
TATGTTTGAT	GTTATGCGCC	TGCGTCTGTA	CTAGTTAGCT	AACTAGCTCT	GTATCTGGCG	900
GACCCGTGGT	GGAAC TGACG	AGTTC TGAA	ACCCGCGCGC	AACCTGGGA	GACGTCCCAG	960
GGACTTTGGG	GGCCGTTTTT	GTGGCCCGAC	CTGAGGAAGG	GAGTCGATGT	GGAATCCGAC	1020
CCCGTCAGGA	TATGTGGTTC	TGGTAGGAGA	CGAGAACCTA	AAACAGTTCC	CGCCTCCGTC	1080
TGAATTTTTG	CTTTCGGTTT	GGAACCGAAG	CCGCGCGTCT	TGTCTGCTGC	AGCGCTGCAG	1140
CATCGTTCTG	TGTTGTCTCT	GTCTGACTGT	GTTTCTGTAT	TTGTCTGAAA	ATTAGGGCCA	1200
GACTGTTACC	ACTCCCTTAA	GTTTGACCTT	AGGTCACTGG	AAAGATGTCT	AGCGGATCGC	1260
TCACAACCAG	TCGGTAGATG	TCAAGAAGAG	ACGTTGGGTT	ACCTTCTGCT	CTGCAGAATG	1320
GCCAACCTTT	AACGTCGGAT	GGCCGCGAGA	CGGCACCTTT	AACCGAGACC	TCATCACCCA	1380
GGTTAAGATC	AAGGTCTTTT	CACCTGGCCC	GCATGGACAC	CCAGACCAGG	TCCCCTACAT	1440
CGTGACCTGG	GAAGCCTTGG	CTTTTGACCC	CCCTCCCTGG	GTCAAGCCCT	TTGTACACCC	1500
TAAGCCTCCG	CCTCCTCTTC	CTCCATCCGC	CCCGTCTCTC	CCCCTTGAAC	CTCCTCGTTC	1560
GACCCCGCCT	CGATCCTCCC	TTTATCCAGC	CCTCACTCCT	TCTCTAGGCG	CCGGAATTCC	1620
GATCTGATCA	AGAGACAGGA	TGAGGATCGT	TTTCGATGAT	TGAACAAGAT	GGATTGCACG	1680
CAGGTTCTCC	GGCCGCTTGG	GTGGAGAGGC	TATTCGGCTA	TGACTGGGCA	CAACAGACAA	1740
TCGGCTGCTC	TGATGCCGCC	GTGTTCGGGC	TGTCAGCGCA	GGGGCGCCCG	GTTCTTTTTG	1800
TCAAGACCGA	CCTGTCCGGT	GCCCTGAATG	AACTGCAGGA	CGAGGCAGCG	CGGCTATCGT	1860
GGCTGGCCAC	GACGGGCGTT	CCTTGCGCAG	CTGTGCTCGA	CGTTGTCACT	GAAGCGGGAA	1920
GGGACTGGCT	GCTATTGGGC	GAAGTGCCGG	GGCAGGATCT	CCTGTCATCT	CACCTTGCTC	1980
CTGCCGAGAA	AGTATCCATC	ATGGCTGATG	CAATGCGGCG	GCTGCATACG	CTTGATCCGG	2040
CTACCTGCCC	ATTCGACCAC	CAAGCGAAAC	ATCGCATCGA	GCGAGCACGT	ACTCGGATGG	2100

AAGCCGGTCT	TGTCGATCAG	GATGATCTGG	ACGAAGAGCA	TCAGGGGCTC	GCGCCAGCCG	2160
AACTGTTTCG	CAGGCTCAAG	GCGCGCATGC	CCGACGGCGA	GGATCTCGTC	GTGACCCATG	2220
GCGATGCCTG	CTTGCCGAAT	ATCATGGTGG	AAAATGGCCG	CTTTTCTGGA	TTCATCGACT	2280
GTGGCCGGCT	GGGTGTGGCG	GACCGCTATC	AGGACATAGC	GTTGGCTACC	CGTGATATTG	2340
CTGAAGAGCT	TGGCGGCGAA	TGGGCTGACC	GCTTCTCTCG	GCTTTACGGT	ATCGCCGCTC	2400
CCGATTCGCA	GCGCATCGCC	TTCTATCGCC	TTCTTGACGA	GTTCTTCTGA	GCGGGACTCT	2460
GGGGTTTCGAA	ATGACCGACC	AAGCGACGCC	CAACCTGCCA	TCACGAGATT	TCGATTCCAC	2520
CGCCGCCTTC	TATGAAAGGT	TGGGCTTCGG	AATCGTTTTTC	CGGGACGCCG	GCTGGATGAT	2580
CCTCCAGCGC	GGGGATCTCA	TGCTGGAGTT	CTTCGCCCAC	CCCGGGCTCG	ATCCCCCTCG	2640
GAGTTGGTTC	AGCTGCTGCC	TGAGGCTGGA	CGACCTCGCG	GAGTTCCTACC	GGCAGTGCAA	2700
ATCCGTCGGC	ATCCAGGAAA	CCAGCAGCGG	CTATCCGCGC	ATCCATGCCC	CCGAACTGCA	2760
GGAGTGGGGA	GGCACGATGG	CCGCTTTGGT	CGACCCGGAC	GGGACGCTCC	TGCGCCTGAT	2820
ACAGAACGAA	TTGCTTGCA	GCATCTCATG	AGTGTGTCTT	CCCGTTTTCC	GCCTGAGGTC	2880
ACTGCGTGGA	TGGAGCGCTG	GCGCCTGCTG	CGCGACGGCG	AGCTGCTCAC	CACCCACTCG	2940
AGGGCGTGCA	GCGCTGCAGA	GGCCGAGTGC	AGAACTGCTC	CAAAGGGACC	TCAAGGCTTT	3000
CCGAGGGACA	CTAGGCTGAC	TCCATCGAGC	CAGTGTAGAG	ATAAGCTTAT	CGATTAGTCC	3060
AATTTGTTAA	AGACAGGATA	TCAGTGGTCC	AGGCTCTAGT	TTTGACTCAA	CAATATCACC	3120
AGCTGAAGCC	TATAGAGTAC	GAGCCATAGA	TAAAATAAAA	GATTTTATTT	AGTCTCCAGA	3180
AAAAGGGGGG	AATGAAAGAC	CCCACCTGTA	GGTTTGGCAA	GCTAGCTTAA	GTAACGCCAT	3240
TTTGCAAGGC	ATGGAAAAAT	ACATAACTGA	GAATAGAGAA	GTTTCAGATCA	AGGTCAGGAA	3300
CAGATGGAAC	AGCTGAATAT	GGGCCAAACA	GGATATCTGT	GGTAAGCAGT	TCCTGCCCCG	3360
GCTCAGGGCC	AAGAACAGAT	GGAACAGCTG	AATATGGGCC	AAACAGGATA	TCTGTGGTAA	3420
GCAGTTCCCTG	CCCCGGCTCA	GGGCCAAGAA	CAGATGGTCC	CCAGATGCGG	TCCAGCCCTC	3480
AGCAGTTTCT	AGAGAACCAT	CAGATGTTTC	CAGGGTGCCC	CAAGGACCTG	AAATGACCCCT	3540
GTGCCCTTATT	TGAACCTAACC	AATCAGTTCG	CTTCTCGCTT	CTGTTTCGCG	GCTTCTGCTC	3600
CCCAGCTCA	ATAAAAGAGC	CCACAACCCC	TCACTCGGGG	CGCCAGTCCCT	CCGATTGACT	3660
GAGTCGCCCCG	GGTACCCGTG	TATCCAATAA	ACCTCTTTCG	AGTTGCATCC	GACTTGTGGT	3720
CTCGCTGTTC	CTTGGGAGGG	TCTCCTCTGA	GTGATTGACT	ACCCGTCAGC	GGGGGTCTTT	3780
CATTTGGGGG	CTCGTCCGGG	ATCGGGAGAC	CCCTGCCCAG	GGACCACCGA	CCCACCACCG	3840
GGAGGTAAGC	TGGCTGCCTC	GCGCGTTTCG	GTGATGACGG	TGAAAACCTC	TGACACATGC	3900

AGCTCCCGGA	GACGGTCACA	GCTTGTCTGT	AAGCGGATGC	CGGGAGCAGA	CAAGCCCGTC	3960
AGGGCGCGTC	AGCGGGTGTT	GGCGGGTGTC	GGGGCGCAGC	CATGACCCAG	TCACGTAGCG	4020
ATAGCGGAGT	GTATACTGGC	TTAACTATGC	GGCATCAGAG	CAGATTGTAC	TGAGAGTGCA	4080
CCATATGCGG	TGTGAAATAC	CGCACAGATG	CGTAAGGAGA	AAATACCGCA	TCAGGCGCTC	4140
TTCCGCTTCC	TCGCTCACTG	ACTCGCTGCG	CTCGGTCGTT	CGGCTGCGGC	GAGCGGTATC	4200
AGCTCACTCA	AAGGCGGTAA	TACGGTTATC	CACAGAATCA	GGGGATAACG	CAGGAAAGAA	4260
CATGTGAGCA	AAAGGCCAGC	AAAAGGCCAG	GAACCGTAAA	AAGGCCGCGT	TGCTGGCGTT	4320
TTTCCATAGG	CTCCGCCCCC	CTGACGAGCA	TCACAAAAAT	CGACGCTCAA	GTCAGAGGTG	4380
GCGAAACCCG	ACAGGACTAT	AAAGATACCA	GGCGTTTCCC	CCTGGAAGCT	CCCTCGTGCG	4440
CTCTCCTGTT	CCGACCCTGC	CGCTTACCGG	ATACCTGTCC	GCCTTTCTCC	CTTCGGGAAG	4500
CGTGGCGCTT	TCTCATAGCT	CACGCTGTAG	GTATCTCAGT	TCGGTGTAGG	TCGTTGCTC	4560
CAAGCTGGGC	TGTGTGCACG	AACCCCCCGT	TCAGCCCGAC	CGCTGCGCCT	TATCCGGTAA	4620
CTATCGTCTT	GAGTCCAACC	CGGTAAGACA	CGACTTATCG	CCACTGGCAG	CAGCCACTGG	4680
TAACAGGATT	AGCAGAGCGA	GGTATGTAGG	CGGTGCTACA	GAGTTCTTGA	AGTGGTGGCC	4740
TAACTACGGC	TACACTAGAA	GGACAGTATT	TGGTATCTGC	GCTCTGCTGA	AGCCAGTTAC	4800
CTTCGAAAAA	AGAGTTGGTA	GCTCTTGATC	CGGCAAACAA	ACCACCGCTG	GTAGCGGTGG	4860
TTTTTTTTGTT	TGCAAGCAGC	AGATTACGCG	CAGAAAAAAA	GGATCTCAAG	AAGATCCTTT	4920
GATCTTTTCT	ACGGGGTCTG	ACGCTCAGTG	GAACGAAAAC	TCACGTTAAG	GGATTTTGGT	4980
CATGAGATTA	TCAAAAAGGA	TCTTCACCTA	GATCCTTTTA	AATTAAAAAT	GAAGTTTTAA	5040
ATCAATCTAA	AGTATATATG	AGTAAACTTG	GTCTGACAGT	TACCAATGCT	TAATCAGTGA	5100
GGCACCTATC	TCAGCGATCT	GTCTATTTTCG	TTCATCCATA	GTTGCCTGAC	TCCCCGTCGT	5160
GTAGATAACT	ACGATACGGG	AGGGCTTACC	ATCTGGCCCC	AGTGCTGCAA	TGATACCGCG	5220
AGACCCACGC	TCACCGGCTC	CAGATTATC	AGCAATAAAC	CAGCCAGCCG	GAAGGGCCGA	5280
GCGCAGAAGT	GGTCCTGCAA	CTTTATCCGC	CTCCATCCAG	TCTATTAATT	GTTGCCGGGA	5340
AGCTAGAGTA	AGTAGTTCGC	CAGTTAATAG	TTTGCGCAAC	GTTGTTGCCA	TTGCTGCAGG	5400
CATCGTGGTG	TCACGCTCGT	CGTTTGGTAT	GGCTTCATTC	AGCTCCGGTT	CCCAACGATC	5460
AAGGCGAGTT	ACATGATCCC	CCATGTTGTG	CAAAAAAGCG	GTTAGCTCCT	TCGGTCCTCC	5520
GATCGTTGTC	AGAAGTAAGT	TGGCCGCAGT	GTTATCACTC	ATGGTTATGG	CAGCACTGCA	5580
TAATTCTCTT	ACTGTCATGC	CATCCGTAAG	ATGCTTTTCT	GTGACTGGTG	AGTACTCAAC	5640
CAAGTCATTC	TGAGAATAGT	GTATGCGGCG	ACCGAGTTGC	TCTTGCCCCG	CGTCAACACG	5700

GGATAATACC GCGCCACATA GCAGAACTTT AAAAGTGCTC ATCATTGGAA AACGTTCTTC	5760
GGGGCGAAAA CTCTCAAGGA TCTTACCGCT GTTGAGATCC AGTTCGATGT AACCCACTCG	5820
TGCACCCAAC TGATCTTCAG CATCTTTTAC TTTCACCAGC GTTTCTGGGT GAGCAAAAAC	5880
AGGAAGGCAA AATGCCGCAA AAAAGGGAAT AAGGGCGACA CGGAAATGTT GAATACTCAT	5940
ACTCTTCCTT TTTCAATATT ATTGAAGCAT TTATCAGGGT TATTGTCTCA TGAGCGGATA	6000
CATATTTGAA TGTATTTAGA AAAATAAACA AATAGGGGTT CCGCGCACAT TTCCCCGAAA	6060
AGTGCCACCT GACGTCTAAG AAACCATTAT TATCATGACA TTAACCTATA AAAATAGGCG	6120
TATCACGAGG CCCTTTCGTC TTCAA	6145

(2) INFORMATION FOR SEQ ID NO:2:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 67 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: other nucleic acid
- (A) DESCRIPTION: /desc = "DNA"

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

GATCTAAGCT TGCGCCCGCA GATCTCGAGC CATGGATCCT AGGCCTGATC ACGCGTCGAC	60
TCGCGAT	67

(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 65 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: other nucleic acid
- (A) DESCRIPTION: /desc = "DNA"

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

CGATCGCGAG TCGACGCGTG ATCAGGCCTA GGATCCATGG CTCGAGATCT GCGGCCGCAA	60
GCTTA	65

(2) INFORMATION FOR SEQ ID NO:4:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 33 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: other nucleic acid

(A) DESCRIPTION: /desc = "DNA"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

AAGCTTGATC ACCACCATGA TTGAACAAGA TGG

33

(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 34 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid
(A) DESCRIPTION: /desc = "DNA"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

CCGGATCCGT CGACCCCGA GTCCCGCTCA GAAG

34

(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 35 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid
(A) DESCRIPTION: /desc = "DNA"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

CCCGGAAGC TTCCACCATG TGGCTGCAGA GCCTG

35

(2) INFORMATION FOR SEQ ID NO:7:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 29 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid
(A) DESCRIPTION: /desc = "DNA"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

AATGGATCCT ATCACTCCTG GACTGGCTC

29

(2) INFORMATION FOR SEQ ID NO:8:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 435 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid
 (A) DESCRIPTION: /desc = "DNA"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

ATGTGGCTGC AGAGCCTGCT GCTCTTGGGC ACTGTGGCCT GCAGCATCTC TGCACCCGCC	60
CGCTCGCCCA GCCCCAGCAC GCAGCCCTGG GAGCATGTGA ATGCCATCCA GGAGGCCCGG	120
CGTCTCCTGA ACCTGAGTAG AGACACTGCT GCTGAGATGA ATGAAACAGT AGAAGTCATC	180
TCAGAAATGT TTGACCTCCA GGAGCCGACC TGCCTACAGA CCCGCCTGGA GCTGTACAAG	240
CAGGGCCTGC GGGGCAGCCT CACCAAGCTC AAGGGCCCCT TGACCATGAT GGCCAGCCAC	300
TACAAGCAGC ACTGCCCTCC AACCCCGGAA ACTTCCTGTG CAACCCAGAT TATCACCTTT	360
GAAAGTTTCA AAGAGAACCT GAAGGACTTT CTGCTTGTC TCCCCTTTGA CTGCTGGGAG	420
CCAGTCCAGG AGTGA	435

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 30 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid
 (A) DESCRIPTION: /desc = "DNA"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

TGTGGATCCA CCATGGGACT GAGTAACATT	30
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(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 35 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid
 (A) DESCRIPTION: /desc = "DNA"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

TTTGGATCCT TAAAAACATG TATCACTTTT GTCGC	35
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(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 972 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: double
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid
(A) DESCRIPTION: /desc = "DNA"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

ATGGGACTGA GTAACATTCT CTTTGTGATG GCCTTCCTGC TCTCTGGTGC TGCTCCTCTG	60
AAGATTCAAG CTTATTTCAA TGAGACTGCA GACCTGCCAT GCCAATTTGC AAACCTCTCAA	120
AACCAAAGCC TGAGTGAGCT AGTAGTATTT TGGCAGGACC AGGAAAACCTT GGTTCCTGAAT	180
GAGGTATACT TAGGCAAAGA GAAATTTGAC AGTGTTTCATT CCAAGTATAT GGGCCGCACA	240
AGTTTTGATT CGGACAGTTG GACCCTGAGA CTTTACAATC TTCAGATCAA GGACAAGGGC	300
TTGTATCAAT GTATCATCCA TCACAAAAAG CCCACAGGAA TGATTCGCAT CCACCAGATG	360
AATTCTGAAC TGTCAGTGCT TGCTAACTTC AGTCAACCTG AAATAGTACC AATTTCTAAT	420
ATAACAGAAA ATGTGTACAT AAATTTGACC TGCTCATCTA TACACGGTTA CCCAGAACCT	480
AAGAAGATGA GTGTTTTGCT AAGAACCAAG AATTCAACTA TCGAGTATGA TGGTATTATG	540
CAGAAATCTC AAGATAATGT CACAGAACTG TACGACGTTT CCATCAGCTT GTCTGTTTCA	600
TTCCCTGATG TTACGAGCAA TATGACCATC TTCTGTATTG TGGAAACTGA CAAGACGCGG	660
CTTTTATCTT CACCTTTCTC TATAGAGCTT GAGGACCCTC AGCCTCCCCC AGACCACATT	720
CCTTGGAATTA CAGCTGTACT TCCAACAGTT ATTATATGTG TGATGGTTTT CTGTCTAATT	780
CTATGGAAAT GGAAGAAGAA GAAGCGGCCT CGCAACTCTT ATAAATGTGG AACCAACACA	840
ATGGAGAGGG AAGAGAGTGA ACAGACCAAG AAAAGAGAAA AAATCCATAT ACCTGAAAGA	900
TCTGATGAAG CCCAGCGTGT TTTTAAAAGT TCGAAGACAT CTTTCATGCGA CAAAAGTGAT	960
ACATGTTTTTT AA	972

(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 29 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid
(A) DESCRIPTION: /desc = "DNA"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

AAAAGCTTGG ATCCACCATG AGTAAAGGA	29
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(2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 30 base pairs
(B) TYPE: nucleic acid

(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid
(A) DESCRIPTION: /desc = "DNA"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

AATCTAGATT ACTATTTGTA TAGTTCATCC

30

(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 1451 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

AAGCTTTGGA GCTAAGCCAG CAATGGTAGA GGGAAGATTC TGCACGTCCC TTCCAGGCGG	60
CCTCCCCGTC ACCACCCCCC CCAACCCGCC CCGACCGGAG CTGAGAGTAA TTCATACAAA	120
AGGACTCGCC CCTGCC'TTGG GGAATCCCAG GGACCGTCGT TAAACTCCCA CTAACGTAGA	180
ACCCAGAGAT CGCTGCGTTC CCGCCCCCTC ACCCGCCCCG TCTCGTCATC ACTGAGGTGG	240
AGAAGAGCCA TGC GTGAGGC TCCGGTGCCC GTCAGTGGGC AGAGCGCACA TCGCCACAG	300
TCCCCGAGAA GTTGGGGGGA GGGGTCGGCA ATTGAACCGG TGCTTAGAGA AGGTGGCGCG	360
GGGTAAACTG GGAAAGTGAT GTCGTGTACT GGCTCCGCCT TTTTCCCAGG GGTGGGGGAG	420
AACCCGTATA TAAGTGCAGT AGTCGCCGTG AACGTTCTTT TTCGCAACGG GTTTGCCGCC	480
AGAACACAGG TAAGTGCCGT GTGTGGTTCC CGCGGGCCTG GCCTCTTTAC GGGTTATGGC	540
CCTTGCGTGC CTTGAATTAC TTCCACGCCC CTGGCTGCAG TACGTGATTC TTGATCCCGA	600
GCTTCGGGTT GGAAGTGGGT GGGAGAGTTC GAGGCCTTGC GCTTAAGGAG CCCCTTCGCC	660
TCGTGCTTGA GTTGAGGCCT GGCCTGGGCG CTGGGGCCCC CGCGTGC GAA TCTGGTGGCA	720
CCTTCGCGCC TGTCTCGCTG CTTTCGATAA GTCTCTAGCC ATTTAAAAATT TTTGATGACC	780
TGCTGCGACG CTTTTTTTCT GGCAAGATAG TCTTGTAAT GCGGGCCAAG ATCTGCACAC	840
TGGTATTTTCG GTTTTTGGGG CCGCGGGCGG CGACGGGGCC CGTGCGTCCC AGCGCACATG	900
TTGCGCGAGG CGGGGCCTGC GAGCGCGGCC ACCGAGAATC GGACGGGGGT AGTCTCAAGC	960
TGGCCGGCCT GCTCTGGTGC CTGGCCTCGC GCCGCCGTGT ATCGCCCCGC CCTGGGCGGC	1020
AAGGCTGGCC CGGTCCGCAC CAGTTGCGTG AGCGGAAAGA TGGCCGCTTC CCGGCCCTGC	1080
TGCAGGGAGC TCAAAATGGA GGACGCGGCG CTCGGGAGAG CGGGCGGGTG AGTCACCCAC	1140

ACAAAGGAAA AGGGCCTTTC CGTCCTCAGC CGTCGCTTCA TGTGACTCCA CGGAGTACCG 1200
 GGCGCCGTCC AGGCACCTCG ATTAGTTCTC GAGCTTTTGG AGTACGTCGT CTTTAGGTTG 1260
 GGGGGAGGGG TTTTATGCGA TGGAGTTTCC CCACACTGAG TGGGTGGAGA CTGAAGTTAG 1320
 GCCAGCTTGG CACTTGATGT AATTCTCCTT GGAATTTGCC CTTTTTGAGT TTGGATCTTG 1380
 GTTCATTCTC AAGCCTCAGA CAGTGGTTCA AAGTTTTTTT CTTCCATTTT AGGTGTCGTG 1440
 AAAACTCTAG A 1451

(2) INFORMATION FOR SEQ ID NO:15:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 24 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: other nucleic acid
 (A) DESCRIPTION: /desc = "DNA"

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

AAGCTTTGGA GCTAAGCCAG CAAT 24

(2) INFORMATION FOR SEQ ID NO:16:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 23 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: other nucleic acid
 (A) DESCRIPTION: /desc = "DNA"

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

TCTAGAGTTT TCACGACACC TGA 23

(2) INFORMATION FOR SEQ ID NO:17:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 28 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: other nucleic acid
 (A) DESCRIPTION: /desc = "DNA"

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

TCTAGAGCGG CCGCGGAGGC CGAATTCG 28

(2) INFORMATION FOR SEQ ID NO:18:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 36 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: other nucleic acid
 - (A) DESCRIPTION: /desc = "DNA"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

GATCCGAATT CGGCCTCCGC GGCCGCTCTA GATGCA

36

(2) INFORMATION FOR SEQ ID NO:19:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 40 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: other nucleic acid
 - (A) DESCRIPTION: /desc = "DNA"
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

GAAGATCTGC GGCCGCCACC ATGTGGCCCC CTGGGTCAGC

40

(2) INFORMATION FOR SEQ ID NO:20:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 29 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: other nucleic acid
 - (A) DESCRIPTION: /desc = "DNA"
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

CCTCTCGAGT TAGGAAGCAT TCAGATAGC

29

(2) INFORMATION FOR SEQ ID NO:21:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 762 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: other nucleic acid
 - (A) DESCRIPTION: /desc = "DNA"
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

ATGTGGCCCC CTGGGTCAGC CTCCCAGCCA CCGCCCTCAC CTGCCGCGGC CACAGGTCTG

60

CATCCAGCGG CTCGCCCTGT GTCCCTGCAG TGCCGGCTCA GCATGTGTCC AGCGCGCAGC

120

CTCCTCCTTG TCGTACCCT GGTCTCCTG GACCACCTCA GTTTGGCCAG AACCTCCCC	180
GTGGCCACTC CAGACCCAGG AATGTTCCCA TGCCTTCACC ACTCCCAAAA CCTGCTGAGG	240
GCCGTCAGCA ACATGCTCCA GAAGGCCAGA CAAACTCTAG AATTTTACCC TTGCACTTCT	300
GAAGAGATTG ATCATGAAGA TATCACAAAA GATAAAACCA GCACAGTGGA GGCCTGTTTA	360
CCATTGGAAT TAACCAAGAA TGAGAGTTGC CTAAATTCCA GAGAGACCTC TTTCATAACT	420
AATGGGAGTT GCCTGGCCTC CAGAAAGACC TCTTTTATGA TGGCCCTGTG CCTTAGTAGT	480
ATTTATGAAG ACTTGAAGAT GTACCAGGTG GAGTTCAAGA CCATGAATGC AAAGCTTCTG	540
ATGGATCCTA AGAGGCAGAT CTTTCTAGAT CAAAACATGC TGGCAGTTAT TGATGAGCTG	600
ATGCAGGCCC TGAATTTCAA CAGTGAGACT GTGCCACAAA AATCCTCCCT TGAAGAACCG	660
GATTTTTTATA AAATAAAAT CAAGCTCTGC ATACTTCTTC ATGCTTTCAG AATTCGGGCA	720
GTGACTATTG ATAGAGTGAT GAGCTATCTG AATGCTTCCT AA	762

(2) INFORMATION FOR SEQ ID NO:22:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 34 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: other nucleic acid
 - (A) DESCRIPTION: /desc = "DNA"

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

AAAGAGCTCC ACCATGTGTC ACCAGCAGTT GGTC	34
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(2) INFORMATION FOR SEQ ID NO:23:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 28 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: other nucleic acid
 - (A) DESCRIPTION: /desc = "DNA"

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

AAGGATCCTA ACTGCAGGGC ACAGATGC	28
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(2) INFORMATION FOR SEQ ID NO:24:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 987 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: double
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid
(A) DESCRIPTION: /desc = "DNA"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

ATGTGTCACC AGCAGTTGGT CATCTCTTGG TTTTCCCTGG TTTTCTGGC ATCTCCCCCTC	60
GTGGCCATAT GGGAACTGAA GAAAGATGTT TATGTCGTAG AATTGGATTG GTATCCGGAT	120
GCCCCTGGAG AAATGGTGGT CCTCACCTGT GACACCCCTG AAGAAGATGG TATCACCTGG	180
ACCTTGGAAC AGAGCAGTGA GGTCTTAGGC TCTGGCAAAA CCCTGACCAT CCAAGTCAAA	240
GAGTTTGGAG ATGCTGGCCA GTACACCTGT CACAAAGGAG GCGAGGTTCT AAGCCATTCTG	300
CTCCTGCTGC TTCACAAAAA GGAAGATGGA ATTTGGTCCA CTGATATTTT AAAGGACCAG	360
AAAGAACCCA AAAATAAGAC CTTTCTAAGA TGCGAGGCCA AGAATTATTC TGGACGTTTC	420
ACCTGCTGGT GGCTGACGAC AATCAGTACT GATTTGACAT TCAGTGTCAA AAGCAGCAGA	480
GGCTCTTCTG ACCCCCAAGG GGTGACGTGC GGAGCTGCTA CACTCTCTGC AGAGAGAGTC	540
AGAGGGGACA ACAAGGAGTA TGAGTACTCA GTGGAGTGCC AGGAGGACAG TGCCTGCCCCA	600
GCTGCTGAGG AGAGTCTGCC CATTGAGGTC ATGGTGGATG CCGTTCACAA GCTCAAGTAT	660
GAAAACTACA CCAGCAGCTT CTTTCATCAGG GACATCATCA AACCTGACCC ACCCAACAAC	720
TTGCAGCTGA AGCCATTAAA GAATTCTCGG CAGGTGGAGG TCAGCTGGGA GTACCCTGAC	780
ACCTGGAGTA CTCCACATTC CTACTTCTCC CTGACATTCT GCGTTCAGGT CCAGGGCAAG	840
AGCAAGAGAG AAAAGAAAGA TAGAGTCTTC ACCGACAAGA CCTCAGCCAC GGTCACTCTGC	900
CGCAAAAATG CCAGCATTAG CGTGCGGGCC CAGGACCGCT ACTATAGCTC ATCTTGAGGC	960
GAATGGGCAT CTGTGCCCTG CAGTTAG	987

(2) INFORMATION FOR SEQ ID NO:25:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 2097 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid
(A) DESCRIPTION: /desc = "DNA"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

ATGAGGCTCG CCGTGGGAGC CCTGCTGGTC TGCGCCGTCC TGGGGCTGTG TCTGGCTGTC	60
CCTGATAAAA CTGTGAGATG GTGTGCAGTG TCGGAGCATG AGGCCACTAA GTGCCAGAGT	120
TTCCGCGACC ATATGAAAAG CGTCATTCCA TCCGATGGTC CCAGTGTTGC TTGTGTGAAG	180
AAAGCCTCCT ACCTTGATTG CATCAGGGCC ATTGCGGCAA ACGAAGCGGA TGCTGTGACA	240

CTGGATGCAG	GTTTGGTGTA	TGATGCTTAC	TTGGCTCCCA	ATAACCTGAA	GCCTGTGGTG	300
GCAGAGTTCT	ATGGGTCAAA	AGAGGATCCA	CAGACTTTCT	ATTATGCTGT	TGCTGTGGTG	360
AAGAAGGATA	GTGGCTTCCA	GATGAACCAG	CTTCGAGGCA	AGAAGTCC TG	CCACACGGGT	420
CTAGGCAGGT	CCGCTGGGTG	GAACATCCCC	ATAGGCTTAC	TTTACTGTGA	CTTACCTGAG	480
CCACGTAAAC	CTCTTGAGAA	AGCAGTGGCC	AATTTCTTCT	CGGGCAGCTG	TGCCCCTTGT	540
GCGGATGGGA	CGGACTTCCC	CCAGCTGTGT	CAACTGTGTC	CAGGGTGTGG	CTGCTCCACC	600
CTTAACCAAT	ACTTCGGCTA	CTCGGGAGCC	TTCAAGTGTC	TGAAGGATGG	TGCTGGGGAT	660
GTGGCCTTTG	TCAAGCACTC	GACTATATTT	GAGAACTTGG	CAAACAAGGC	TGACAGGGAC	720
CAGTATGAGC	TGCTTTGCCT	AGACAACACC	CGGAAGCCGG	TAGATGAATA	CAAGGACTGC	780
CACTTGGCCC	AGGTCCCTTC	TCATACCGTC	GTGGCCCGAA	GTATGGGCGG	CAAGGAGGAC	840
TTGATCTGGG	AGCTTCTCAA	CCAGGCCCCAG	GAACATTTTG	GCAAAGACAA	ATCAAAAAGAA	900
TTCCAACAT	TCAGCTCTCC	TCATGGGAAG	GACCTGCTGT	TTAAGGACTC	TGCCCCACGGG	960
TTTTTAAAG	TCCCCCAAG	GATGGATGCC	AAGATGTACC	TGGGCTATGA	GTATGTCACT	1020
GCCATCCGGA	ATCTACGGGA	AGGCACATGC	CCAGAAGCCC	CAACAGATGA	ATGCAAGCCT	1080
GTGAAGTGGT	GTGCGCTGAG	CCACCACGAG	AGGCTCAAGT	GTGATGAGTG	GAGTGTTAAC	1140
AGTGTAGGGA	AAATAGAGTG	TGTATCAGCA	GAGACCACCG	AAGACTGCAT	CGCCAAGATC	1200
ATGAATGGAG	AAGCTGATGC	CATGAGCTTG	GATGGAGGGT	TTGTCTACAT	AGCGGGCAAG	1260
TGTGGTCTGG	TGCCTGTCTT	GGCAGAAAAC	TACAATAAGA	GCGATAATTG	TGAGGATACA	1320
CCAGAGGCAG	GGTATTTTGC	TGTAGCAGTG	GTGAAGAAAT	CAGCTTCTGA	CCTCACCTGG	1380
GACAATCTGA	AAGGCAAGAA	GTCCTGCCAT	ACGGCAGTTG	GCAGAACCGC	TGGCTGGAAC	1440
ATCCCCATGG	GCCTGCTCTA	CAATAAGATC	AACCACTGCA	GATTTGATGA	ATTTTTCAGT	1500
GAAGGTTGTG	CCCCTGGGTC	TAAGAAAGAC	TCCAGTCTCT	GTAAGCTGTG	TATGGGCTCA	1560
GGCCTAAACC	TGTGTGAACC	CAACAACAAA	GAGGGATACT	ACGGCTACAC	AGGCGCTTTC	1620
AGGTGTCTGG	TTGAGAAGGG	AGATGTGGCC	TTTGTGAAAC	ACCAGACTGT	CCCACAGAAC	1680
ACTGGGGGAA	AAAACCTTGA	TCCATGGGCT	AAGAATCTGA	ATGAAAAAGA	CTATGAGTTG	1740
CTGTGCCTTG	ATGGTACCAG	GAAACCTGTG	GAGGAGTATG	CGAACTGCCA	CCTGGCCAGA	1800
GCCCCGAATC	ACGCTGTGGT	CACACGGAAA	GATAAGGAAG	CTTGCGTCCA	CAAGATATTA	1860
CGTCAACAGC	AGCACCTATT	TGGAAGCAAC	GTAAGTACTG	GCTCGGGCAA	CTTTTGTTTG	1920
TTCCGGTTCG	AAACCAAGGA	CCTTCTGTTC	AGAGATGACA	CAGTATGTTT	GGCCAAACTT	1980
CATGACAGAA	ACACATATGA	AAAATACTTA	GGAGAAGAAT	ATGTCAAGGC	TGTTGGTAAC	2040

CTGAGAAAAT GCTCCACCTC ATCACTCCTG GAAGCCTGCA CTTTCCGTAG ACCTTAA

2097

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